

Amendment and Response

Applicant: Cory Watkins et al.

Serial No.: 10/073,426

Filed: February 11, 2002

Docket No.: A126.143.101

Title: CONFOCAL 3D INSPECTION SYSTEM AND PROCESS

IN THE CLAIMS

Please amend claims 1, 8, and 16 as follows:

1.(Currently Amended) An inspection device for inspecting projections on a substrate such as bumps on microelectronics such as semiconductors, the inspection device comprising:

a light source; and

a non-laser confocal sensor;

wherein the inspection device is adapted to rapidly ~~inspect projections on a substrate~~
determine heights of projections on the substrate based upon light intensities
identified during a plurality of passes, wherein the confocal sensor is stationary
relative to the light source during each pass.

2.(Original) The inspection device of claim 1 further comprising a camera for collecting focused light.

3.(Original) The inspection device of claim 2 wherein the non-laser confocal sensor includes a pellicle beamsplitter for receiving light from the light source and redirecting said light.

4.(Original) The inspection device of claim 3 wherein the non-laser confocal sensor includes an aperture array for receiving light from the pellicle beamsplitter.

5.(Previously Presented) The inspection device of claim 3 wherein the non-laser confocal sensor includes a dual telecentric object reimager including a plurality of lenses.

6.(Original) The inspection device of claim 3 wherein the non-laser confocal sensor includes a telecentric camera imager including a plurality of lenses.

7.(Original) The inspection device of claim 3 wherein the non-laser confocal sensor includes:

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an aperture array for receiving light from the pellicle beamsplitter;
a dual telecentric object reimager including a plurality of lenses; and
a telecentric camera imager including a plurality of lenses.

8.(Currently Amended) An inspection device for inspecting projections on a substrate such as bumps on microelectronics such as semiconductors, the inspection device comprising:

a light source; and

a white light confocal sensor;

wherein the inspection device is adapted to rapidly ~~inspect projections on a substrate~~
determine projection heights over an entire surface of the substrate.

9.(Original) The inspection device of claim 8 further comprising a camera for collecting focused light.

10.(Original) The inspection device of claim 9 wherein the confocal sensor includes a pellicle beamsplitter for receiving light from the light source and redirecting said light.

11.(Original) The inspection device of claim 10 wherein the confocal sensor includes an aperture array for receiving light from the pellicle beamsplitter.

12.(Previously Presented) The inspection device of claim 10 wherein the confocal sensor includes a dual telecentric object reimager including a plurality of lenses.

13.(Original) The inspection device of claim 10 wherein the confocal sensor includes a telecentric camera imager including a plurality of lenses.

14.(Original) The inspection device of claim 10 wherein the confocal sensor includes:

an aperture array for receiving light from the pellicle beamsplitter;

a dual telecentric object reimager including a plurality of lenses; and

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a telecentric camera imager including a plurality of lenses.

15.(Original) The inspection device of claim 10 wherein light source is one of a halogen light source, an arc light, light emitting diodes including white or colored light emitting diodes, and fluorescent lights.

16.(Currently Amended) An inspection device for inspecting projections on a substrate such as bumps on microelectronics such as semiconductors:

a non-laser light source; and

a confocal sensor;

wherein the inspection device is adapted to rapidly ~~inspect projections on a substrate~~determine projection heights based upon light intensities identified during a plurality of passes of light from the light source at differing optical elevations of the light source relative to the substrate.

17.(Original) The inspection device of claim 16 further comprising a camera for collecting focused light, and a pellicle beamsplitter for receiving light from the light source and redirecting said light.

18.(Original) The inspection device of claim 17 wherein the confocal sensor includes:

an aperture array for receiving light from the pellicle beamsplitter;

a dual telecentric object reimager including a plurality of lenses; and

a telecentric camera imager including a plurality of lenses.

19.(Original) The inspection device of claim 18 wherein light source is one of a halogen light source, an arc light, light emitting diodes including white or colored light emitting diodes, and fluorescent lights.

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20.(Original) The inspection device of claim 16 wherein light source is one of a halogen light source, an arc light, light emitting diodes including white or colored light emitting diodes, and fluorescent lights.

21.(Previously Presented) The inspection device of claim 16, wherein the confocal sensor is characterized by the absence of a Nipkow disk.